```
ApxIA     MANSQLDRVKGLIDSLNQHTKSAAKSGAGALKNGLGQV----KQAGQKLILYIPKDYQAS 56
ApxIIA    MSKITLSSLKSSLQQGLKNGKNKLNQAGTTLKNGLTQTGHSLQNGAKKLILYIPQGYDSG 60
          *::  *. :*. ::.  :: *.  :... :***** *.    ::..:*******:.*::.

ApxIA     TGSSLNDLVKAAEALGIEVHRSEKNGTALAKELFGTTEKLLGFSERGIALFAPQFDKLLN 116
ApxIIA    QGNGVQDLVKAANDLGIEVWREERSNLDIAKTSFDTTQKILGFTDRGIVLFAPQLDNLLK 120
           *..::******: ***** *.*:..  :**  *.**:*:***::***.*****:*:**:

ApxIA     KNQKLSKSLGGSSEALGQRLNKTQTALSALQSFLGTAIAGMDLDSLLRRRRNGEDVSGSE 176
ApxIIA    KNPKIGNTLG-SASSISQNIGKANTVLGGIQSILGSVLSGVNLNELLQNK----DPNQLE 175
          ** *:.::** *:.::.*.:.*::*.*..:**:**.::*::*:.**:.:    * .  *

ApxIA     LAKAGVDLAAQLVDNIASATGTVDAFAEQLGKLAMPYLTLA-LSGLASKLNNLPDLSLAG 235
ApxIIA    LAKAGLELTNELVGNIASSVQTVDAFAEQISKLGSHLQNVKGLGGLSNKLQNLPDLGKAS 235
          *****::*: :**.****:. ********:.**.    .:  *.**:.**:*****. *.
                H1
ApxIA     PGFDAVSGILSVVSASFLLSNKDADAGTKAAAGIEISTKILGNIGKAVSQYIIAQRVAAG 295
ApxIIA    LGLDIISGLLSGASAGLLLADKEASTEKKAAAGVEFANQIIGNVTKAVSSYILAQRVASG 295
          *:* :**:** .**.:**::*:*.: .*****:*::.:*:**: ****.**:*****:*
                     H2
ApxIA     LSTTAATGGLIGSVVALAISPLSFLNVADKFERAKQLEQYSERFKKFGYEGDSLLASFYR 355
ApxIIA    LSSTGPVAALIASTVALAVSPLSFLNVADKFKQADLIKSYSERFQKLGYDGDRLLADFHR 355
          **:*.....**.*.****:************:*. ::.*****:*:**:** ***.*:*
                                H3
ApxIA     ETGAIEAALTTINSVLSARSAGVGAAATGSLVGAPVAALVSAITGIISGILDASKQAIFE 415
ApxIIA    ETGTIDASVTTINTALAAISGGVGAASAGSLVGAPVALLVAGVTGLITTILEYSKQAMFE 415
          ***:*:*::****:.*:* *.*****::********* **:.:**:*: **: ****:**

ApxIA     RVATKLANKIDEWEKKHGKNYFENGYDARHSAFLEDTFELLSQYNKEYSVERVVAITQQR 475
ApxIIA    HVANKVHDRIVEWEKKHNKNYFEQGYDSRHLADLQDNMKFLINLNKELQAERVVAITQQR 475
          :**.*: ::* ******.*****:***:** * *:*.:::* : *** ..**********

ApxIA     WDVNIGELAGITRKGSDTKSGKAYVDFFEEGKLLEKEPDRFDKKVFDPLEGKIDLSSIN- 534
ApxIIA    WDNQIGDLAAISRRTDKISSGKAYVDAFEEGQHQSYDSS----VQLDNKNGIINISNTNR 531
          ** :**:**.*:*: .. .******* ****:  . :..      :*  :* *::*. *

ApxIA     KTTLLKFVTPVFTAGEEIRERKQTGKYQYMTELFVKGKEKWVVTGVQSHNAIYDYTNLIQ 594
ApxIIA    KTQSVLFRTPLLTPGEENRERIQEGKNSYITKLHIQRVDSWTVTDGDAS-SSVDFTNVVQ 590
          **  : * **::*.*** *** * ** .*:*:*.::  :.*.**. ::  :  *:**::*
```

Fig. 1

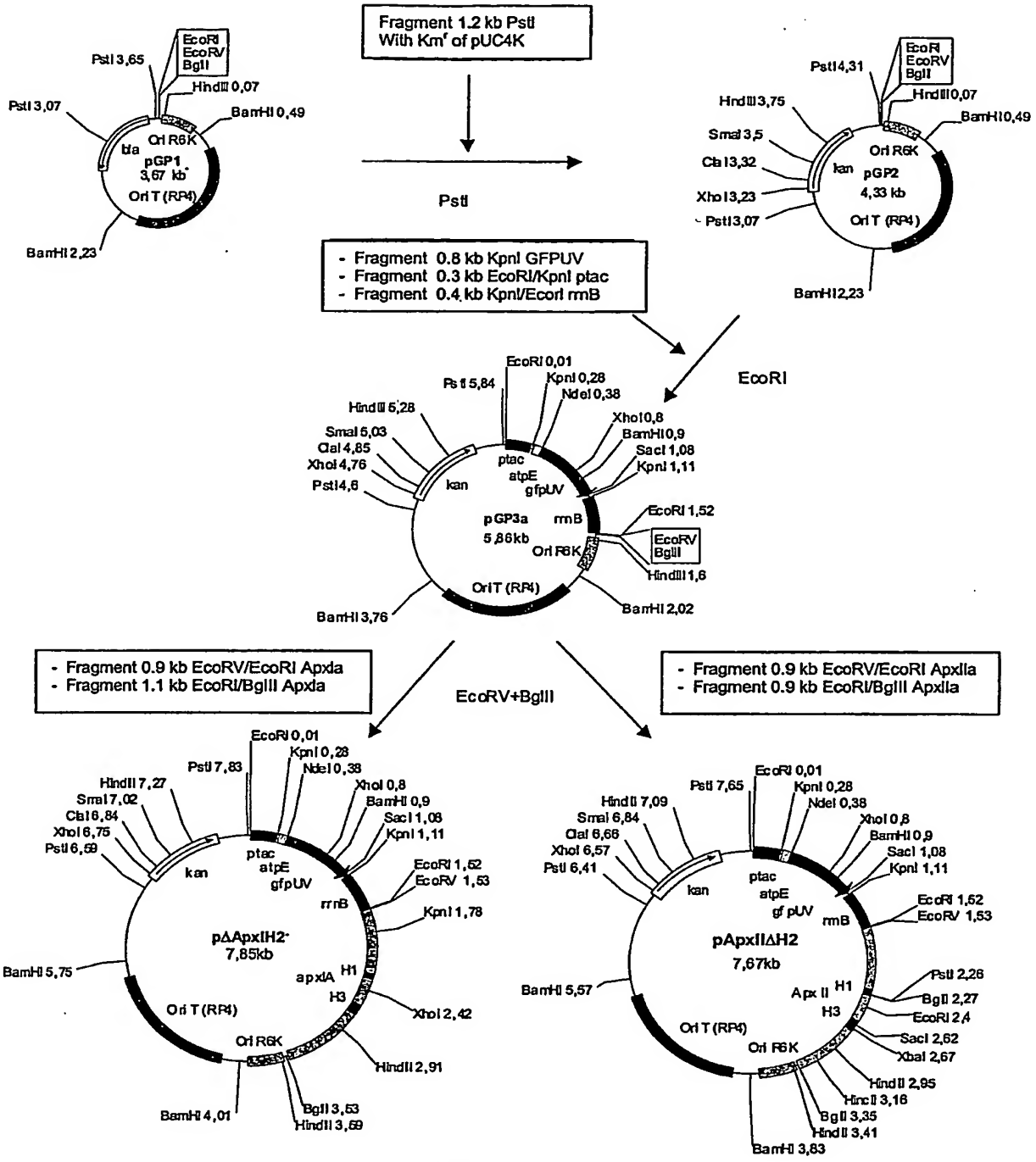
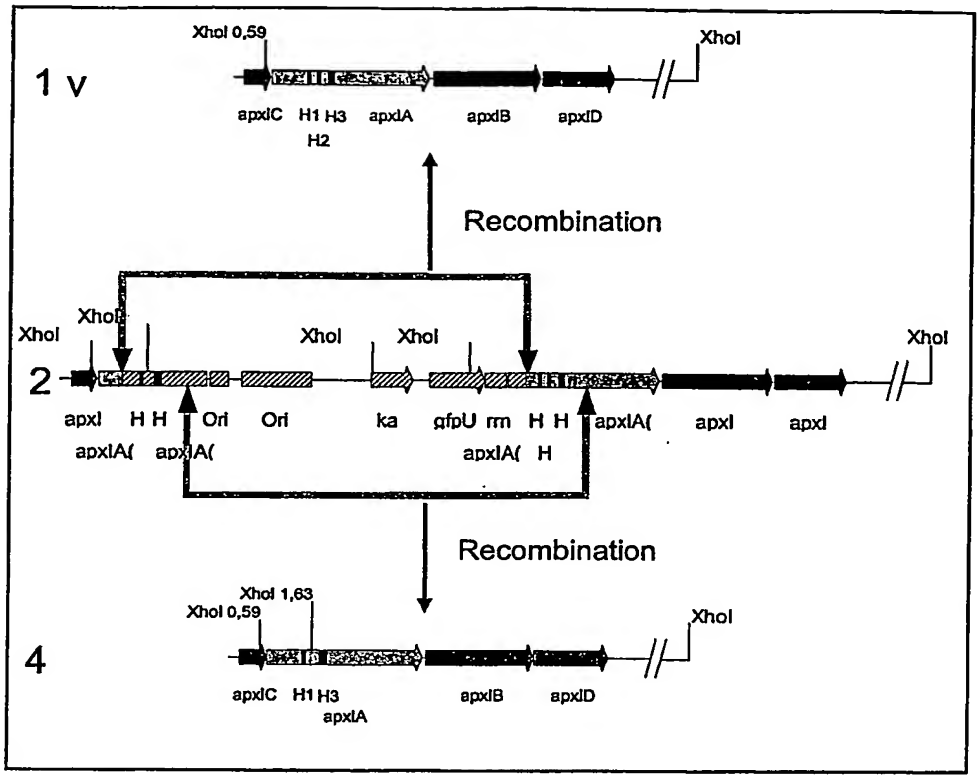
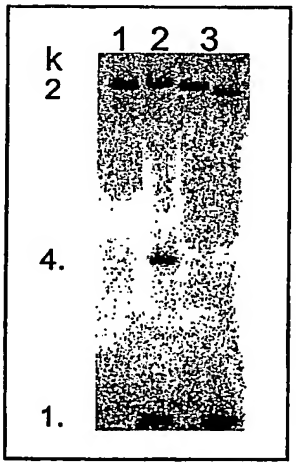

Fragment 1.2 kb PstI
With Km^r of pUC4K
PstI
EcoRI
EcoRV
BglI
PstI 3,65
HindIII 0,07
PstI 3,07
BamHI 0,49
tla
Ori R6K
pGP1
3,67 kb
Ori T (RP4)
BamHI 2,23
PstI 4,31
HindIII 3,75
SmaI 3,5
ClaI 3,32
XhoI 3,23
PstI 3,07
kan
pGP2
4,33 kb
- Fragment 0.8 kb KpnI GFPUV
- Fragment 0.3 kb EcoRI/KpnI ptac
- Fragment 0.4 kb KpnI/EcoRI rrnB
EcoRI
EcoRI 0,01
KpnI 0,28
NdeI 0,38
PstI 5,84
HindIII 5,28
SmaI 5,03
ClaI 4,85
XhoI 4,76
PstI 4,6
XhoI 0,8
BamHI 0,9
SacI 1,08
KpnI 1,11
ptac
atpE
gfpUV
pGP3a
5,86kb
rrnB
EcoRI 1,52
EcoRV
BglII
HindIII 1,6
BamHI 3,76
BamHI 2,02
- Fragment 0.9 kb EcoRV/EcoRI ApxIa
- Fragment 1.1 kb EcoRI/BglII ApxIa
EcoRV+BglII
- Fragment 0.9 kb EcoRV/EcoRI ApxIIa
- Fragment 0.9 kb EcoRI/BglII ApxIIa
PstI 7,83
HindII 7,27
SmaI 7,02
ClaI 6,84
XhoI 6,75
PstI 6,59
EcoRV 1,53
KpnI 1,78
pΔApxIH2-
7,85kb
apxA
H1
H3
BamHI 5,75
XhoI 2,42
Ori T (RP4)
Ori R6K
HindII 2,91
BamHI 4,01
BglII 3,53
HindII 3,69
PstI 7,65
HindII 7,09
SmaI 6,84
ClaI 6,66
XhoI 6,57
PstI 6,41
pApxIIΔH2
7,67kb
Apx II
BamHI 5,57
PstI 2,26
BglII 2,27
EcoRI 2,4
SacI 2,62
XbaI 2,67
HindII 2,95
HincII 3,16
BglII 3,35
HindII 3,41
BamHI 3,83

Fig. 2


1 v
XhoI 0,59
XhoI
apxIC H1 H3 apxIA apxIB apxID
H2
Recombination
XhoI
XhoI
XhoI
XhoI
XhoI
2
apxI H H Ori Ori ka gfpU rrn H H apxIA(apxI apxI
apxIA(apxIA(apxIA(H
Recombination
XhoI 1,63
XhoI 0,59
XhoI
4
apxIC H1 H3 apxIB apxID
apxIA

B


1 2 3
k
2
4.
1.

A

C

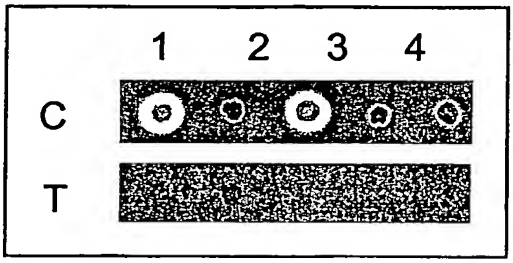
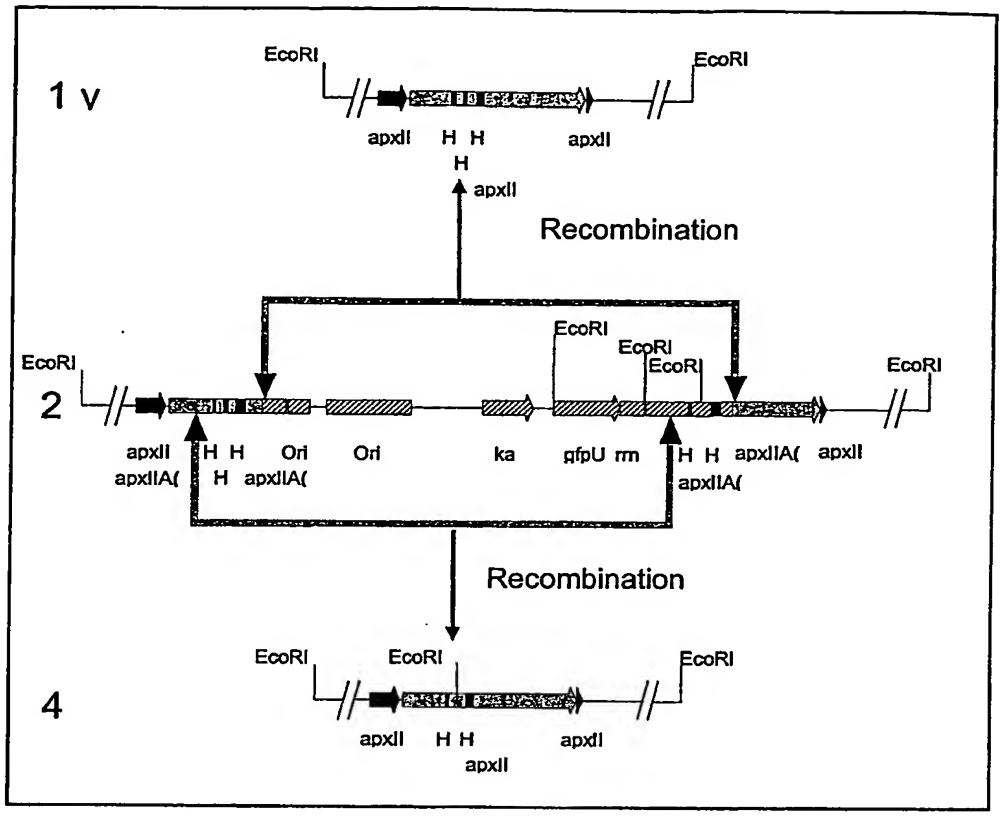
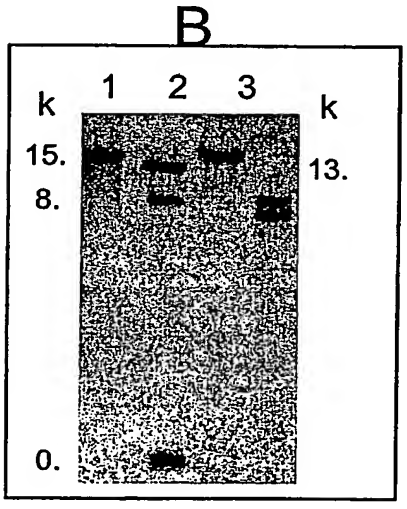

1 2 3 4
C
T

Fig. 3


1 v
EcoRI
EcoRI
apxII H H apxII
H
apxII
Recombination
EcoRI
EcoRI
EcoRI
EcoRI
EcoRI
2
apxII H H Ori Ori ka gfpU rrn H H apxIIA(apxII
apxIIA(H apxIIA(
apxIIA(
Recombination
EcoRI
EcoRI
EcoRI
4
apxII H H apxII
apxII


B
k
1
2
3
k
15.
8.
13.
0.

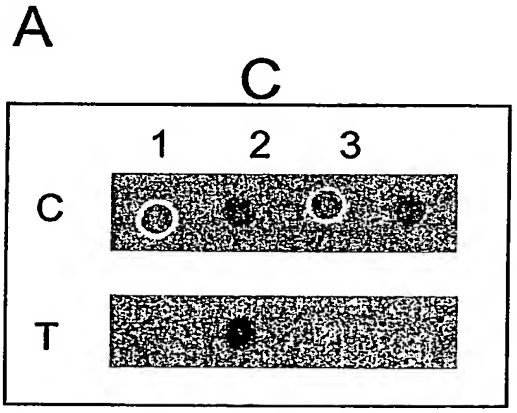

A
C
1
2
3
C
T

Fig. 4

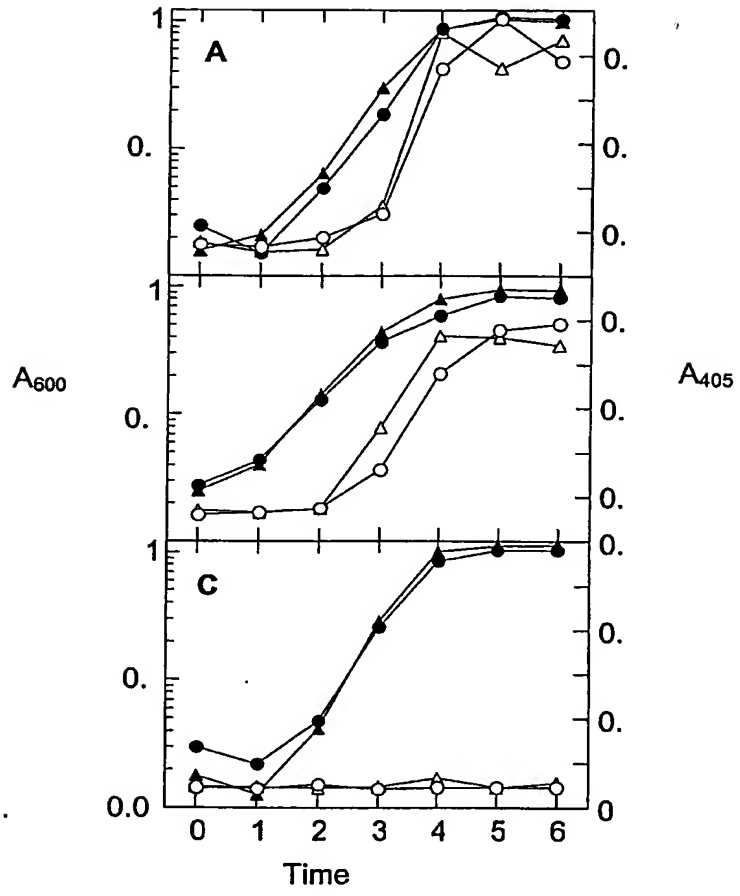


Fig. 5

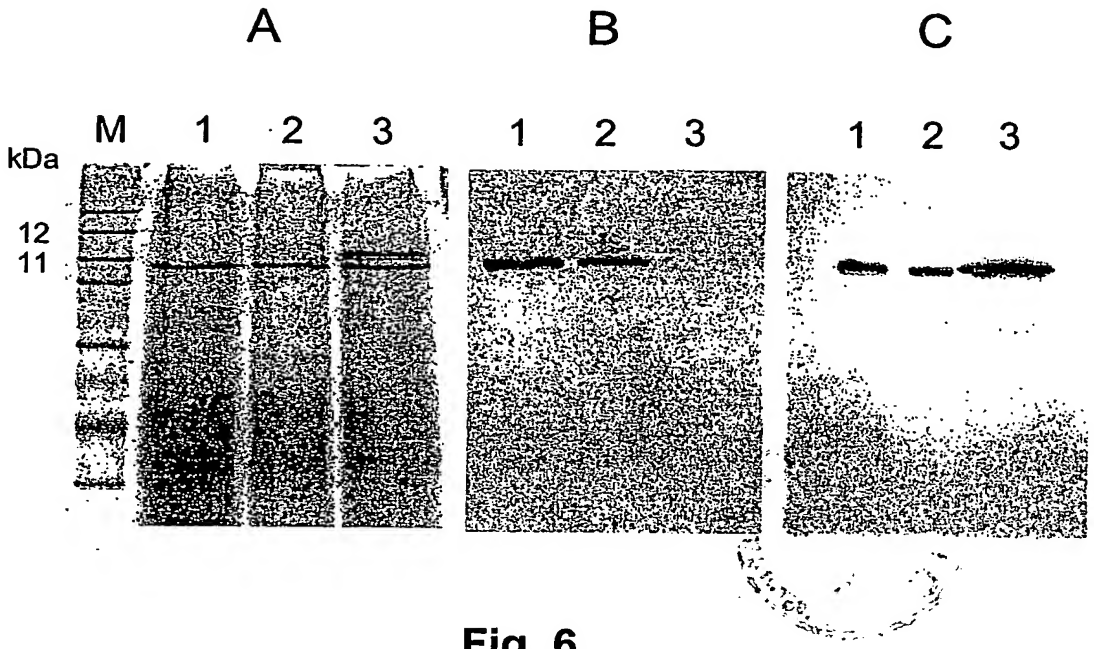


Fig. 6

BEST AVAILABLE COPY